Project Report: Delivery of Organic Materials to Planets

Focus Group Chair(s): Jack Farmer

Focus Group Description & Activities

During Year 4, the NAI Mars Focus Group (MFG) met via videocon to review candidate landing sites for the 2003 Mars Exploration Rover (MER) mission. Presentation materials and supporting documentation have been archived on the ASU Astrobiology web site (Mars Focus Group node) for future reference (http://astrobiology.asu.edu/focus/mars/intro.html). At these meetings, about a dozen potential landing sites were reviewed to assess their potential for (1) meeting basic engineering constraints for a safe landing, while (2) still providing exciting opportunities for astrobiology−based science. Based on these discussions, landing site priorities were established and conveyed to the broader community by MFG members at two NASA−sponsored MER landing site workshops. Site−selection procedures and progress reports were also presented to the NAI Executive Council in September 2001 and at a community meeting held in conjunction with the Astrobiology Science Conference in April 2002. By late spring 2002, the landing site−selection process had narrowed the field to two potential landing sites (the hematite site at Terra Meridiani and Gusev Crater), both of which had been given a high priority for astrobiology during previous deliberations of the NAI Mars Focus Group.

The Mars Exploration Payload Assessment Group (MEPAG) is the principal community−based group for providing science input to NASA's Mars Program. Several NAI astrobiologists were active members of MEPAG during the past year. Historically, astrobiology has been underrepresented on the MEPAG and other NASA Mars Program advisory groups. To increase overall participation of the astrobiology community in Mars mission planning, this spring the MEPAG established an Astrobiology Science Steering Group (ASSG) of about 25 new members. The NAI MFG played an active role by providing about a third of the members of the new ASSG.

Twice during June 2002, the NAI Mars Focus Group met jointly (via videocon − telecon) with the MEPAG's Astrobiology Science Steering Group to (1) review the status of the current Mars Program and 2) provide science and payload recommendations for the Mars Smart Lander mission, which will be launched in 2009. These joint discussions will continue through the summer of 2002 to review the role of sample return in the astrobiological exploration of Mars and to identify possible discovery−driven astrobiology science investigations that could be pursued during the decade after 2009. Supporting information and discussion summaries have been archived on the NAI Mars Focus Group node of ASU's astrobiology website (see above website). Joint NAI MFG and

MEPAG Astrobiology Science Steering Group recommendations will be presented in a white paper to NASA Mars Program managers during August 2002.

Highlights

- The NASA Astrobiology Institute's Mars Focus Group reviewed candidate landing sites for the 2003 Mars Exploration Rover mission, and within mission engineering constraints, identified top landing site priorities based on astrobiology science potential. These recommendations were carried forward during the planning process through the participatrion of NAI MFG members in two community landing site workshops. The down selection process led to the selection of two landing sites: the hematite site at Terra Meridiani and Gusev Crater, paleolake basins that are of great interest in the search for evidence of an ancient Martian biosphere.

Roadmap Objectives

- ***Objective No. 5:*** Linking Planetary Biological Evolution
- ***Objective No. 8:*** Past Present Life on Mars
- ***Objective No. 11:*** Origin of Habitable Planets
- ***Objective No. 17:*** Planetary Protection

Mission Involvement

Mission Class*	***Mission Name (for class 1 or 2) OR Concept (for class 3)***	***Type of Involvement*** **
1	'03 Mars Exploration Rover	Planning support, data analysis, background research
2	'09 Mars Smart Lander	Planning support, data analysis, background research

* Mission Class: Select 1 of 3 Mission Class types below to classify your project:
1. Now flying OR Funded & in development (e.g., Mars Odyssey, MER 2003, Kepler)
2. Named mission under study / in development, but not yet funded (e.g., TPF, Mars Lander 2009)
3. Long−lead future mission / societal issues (e.g., far−future Mars or Europa, biomarkers, life definition)

** Type of Involvement = Role / Relationship with Mission
Specify one (or more) of the following: PI, Co−I, Science Team member, planning support, data analysis, background research, instrument/payload development, research or analysis techniques, other (specify).

Through group videocon discussions, telecons, e−mail exchanges and community presentations over the past year, the NAI Mars Focus Group has

provided an ongoing forum for reviewing and updating the goals, objectives, investigations, and measurement requirements for the astrobiological exploration of Mars. Recommendations flowing from these discussions have shaped the Mars Exploration Program, creating a robust conceptual framework that has proven to be highly relevant for planning future Mars missions.